

**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL SEARCH REPORT**  
(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 000711-0058	<b>FOR FURTHER ACTION</b>		see Form PCT/ISA/220 as well as, where applicable, item 5 below
International application No. <b>PCT/CA2005/000138</b>	International filing date (day/month/year) 03 February 2005 (03-02-2005)	(Earliest)Priority date (day/month/year) 03 February 2004 (03-02-2004)	
<p><b>Applicant</b>  <b>UNIVERSITE DE MONTREAL ET AL</b></p>			

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
  - a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
    - The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
  - b.  With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.
  2.  Certain claims were found **unsearchable** (see Box No. II).
  3.  **Unity of invention is lacking** (see Box No. III).
  4. With regard to the **title**,
    - the text is approved as submitted by the applicant.
    - the text has been established by this Authority to read as follows :
  5. With regard to the **abstract**,
    - the text is approved as submitted by the applicant.
    - the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
  6. With regard to the **drawings**,
    - a. the **figure of the drawings** to be published with the abstract is Figure No.
      - as suggested by the applicant.
      - as selected by this authority, because the applicant failed to suggest a figure.
      - as selected by this Authority, because this figure better characterizes the invention.
    - b.  none of the figures is to be published with the abstract.

**INTERNATIONAL SEARCH REPORT**

International application No.  
PCT/CA2005/000138

**CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A23K 1/16, A23K 1/18

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A23K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)  
WEST, DELPHION

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No(s).
X	US 6500423 (OLSHENITSKY and BUCHMAN) 31 December 2002 (31-12-2002) whole document	1,3-14,16-30
X	WO 99/08532 (DOYLE ET AL.) 25 February 1999 (25-02-1999) whole document	1,3-14,16-30

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

29 March 2005 (29-03-2005)

Date of mailing of the international search report

16 May 2005 (16-05-2005)

Name and mailing address of the ISA/CA  
Canadian Intellectual Property Office  
Place du Portage I, C114 - 1st Floor, Box PCT  
50 Victoria Street  
Gatineau, Quebec K1A 0C9  
Facsimile No.: 001(819)953-2476

Authorized officer

Elizabeth A. McKay Andrews (819) 997-2950

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
PCT/CA2005/000138

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
US6500423	31-12-2002	AU778789 B2 AU2100402 A AU4947000 A BR0012104 A BR0116178 A CA2375599 A1 CA2430292 A1 CN1494374 A EP1185618 A1 EP1343370 A2 IL130303D D0 IL156213D D0 JP2003501080T T JP2004534512T T MXPA03004851 A NZ515830 A NZ527587 A PL352703 A1 US6500467 B2 US6503505 B2 US6511661 B2 US6514494 B2 US6524575 B2 US6524576 B2 US6534053 B2 US6534054 B2 US6544508 B2 US6544509 B2 US6544510 B2 US6569424 B2 US2004235662 A1 WO0075284 A1 WO0243649 A2 ZA200304747 A	23-12-2004 11-06-2002 28-12-2000 12-03-2002 14-10-2003 14-12-2000 06-06-2002 05-05-2004 13-03-2002 17-09-2003 01-06-2000 23-12-2003 14-01-2003 18-11-2004 04-05-2004 28-11-2003 28-01-2005 08-09-2003 31-12-2002 07-01-2003 28-01-2003 04-02-2003 25-02-2003 25-02-2003 18-03-2003 18-03-2003 08-04-2003 08-04-2003 08-04-2003 27-05-2003 25-11-2004 14-12-2000 06-06-2002 03-09-2004

WO9908532	25-02-1999	AU735914 B2 AU8409598 A BR9811179 A CA2296763 A1 CN1126454C C EP1005273 A1 JP2001514868T T NZ502420 A US5965128 A	19-07-2001 08-03-1999 25-07-2000 25-02-1999 05-11-2003 07-06-2000 18-09-2001 28-09-2001 12-10-1999
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**PATENT COOPERATION TREATY**

From the  
INTERNATIONAL SEARCHING AUTHORITY

ROBIC  
Centre CDP Capital  
1001 Square Victoria  
Bloc E - 8ieme Etage  
MONTREAL, Quebec

**PCT**

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

(PCT Rule 43bis.1)

Date of mailing (day/month/year)	16 May 2005 (16-05-2005)
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Applicant's or agent's file reference  
000711-0058

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.  
**PCT/CA2005/000138**

International filing date (day/month/year)  
03 February 2005 (03-02-2005)

Priority date (day/month/year)  
03 February 2004 (03-02-2004)

International Patent Classification (IPC) or both national classification and IPC  
IPC 7 A23K 1/16, A23K 1/18

Applicant  
UNIVERSITE DE MONTREAL ET AL

1. This opinion contains indications relating to the following items :

<input checked="" type="checkbox"/> Box No. I	Basis of the opinion
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement.
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input checked="" type="checkbox"/> Box No. VIII	Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/CA  
Canadian Intellectual Property Office  
Place du Portage I, C114 - 1st Floor, Box PCT  
50 Victoria Street  
Gatineau, Quebec K1A 0C9  
Facsimile No.: 001(819)953-2476

Authorized officer

Elizabeth A. McKay Andrews (819) 997-2950

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/CA2005/000138

Box No. I Basis of this opinion

.. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

This opinion has been established on the basis of a translation from the original language into the following language  
which is the language of a translation furnished for the purposes of international search  
(under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of :

- type of material
  - a sequence listing
  - table(s) related to the sequence listing
- format of material
  - in written format
  - in computer readable form
- time of filing/furnishing
  - contained in the international application as filed.
  - filed together with the international application in computer readable form.
  - furnished subsequently to this Authority for the purposes of search.

3.  In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statement that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments :

Box No. V

Reasoned statement under Rule 43bis.1(a)(I) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims 2,4,5,8,9,11,15,21,22,25,26,28	YES
	Claims 1,3,6,7,10,12-14,16-20,23,24,27,29,30	NO
Inventive step (IS)	Claims 2,15	YES
	Claims 1,3-14,16-30	NO
Industrial applicability (IA)	Claims 1-30	YES
	Claims none	NO

## 2. Citations and explanations :

## 1 Reference is made to the following documents:

D1 US 6500423  
D2 WO 99/08532

2 D1 teaches non-pathogenic probiotic microorganisms derived from *E. coli* are capable of restoring normal GI flora of man and a variety of mammals and avians. The use of *Escherichia coli* strain BU-230-98 ATTC Deposit No. 20226 (column 3, lines 49-51) is shown to decrease mortality and improve weight gain for piglets (Example 14), effectively treat lambs and goat kids for pathogenic *E. coli* infections (Example 19), to improve weight gain and treat diarrhea in poultry (Example 20), and treat symptoms of diarrhea in puppies (Example 21).

D2 teaches specific strains of probiotic *E. coli* having the property of inhibiting the growth of pathogenic *E. coli* O157:H7 in ruminants. It is well known that infection with pathogenic *E. coli* causes diarrhea with resultant poor weight gain in domestic animals.

3 Claims 1,3,6,7,10,12-14,16-20,23,24,27,29 and 30 are anticipated by D1 because the prior art teaches improving weight gain in mammals and avians by administering a strain of *E. coli* in the feed (solid or milk) or water of the animal. The *Escherichia coli* strain defined in the claims of the present application is not distinguished from that taught in D1, or those taught in D2. The effect on weight gain of the F4<sup>+</sup> *Escherichia coli* strain defined in the claims is not shown to be different than the effect shown for the prior art *E. coli* strains. The prior art D1 specifically teaches improved weight gain for post-weaning piglets and post-hatching broiler chickens and turkeys.

Claims 1,3,6,7,10,12-14,16-20,23,24,27,29 and 30 do not meet the requirements of novelty and inventive step, and do not satisfy Article 33(2) and (3) PCT.

4 Claims 4,5,8,9,11,21,22,25,26 and 28 do not involve and inventive step over the teachings of D1 or D2. These claims define the effective amount of the *E. coli* strain for use, the age of the animal when treated, and treatment of a mouse with the *E. coli* strain to promote weight gain. The amount of bacteria to use and the age of the animal to be treated both fall within the scope of trial and error for optimizing treatment usually practised by a person skilled in the art. The treatment of mice to promote weight gain would be obvious to one skilled in the art having regard to D1 since the treatment was already shown to be effective for piglets, broiler chickens, turkeys, and puppies.

Claims 4,5,8,9,11,21,22,25,26 and 28 do not satisfy Article 33(3) PCT.

----- continued on supplemental sheet -----

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/CA2005/000138

**Box No. VIII      Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made :

To meet the requirements of Rule 5.1(a)(ii) PCT, the documents US 6500423 and WO 99/08532 should be identified in the description and the relevant background art disclosed therein should be briefly discussed.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box No. V 2. Citations and explanations:

5 Claims 2 and 15 are novel and unobvious since none of the prior art teach the homogenizing of growth among a herd of animals by using a non-pathogenic *Escherichia coli* strain. Homogenous weight across a herd of animals is of economic benefit to the farmer at time of sale or slaughter.

Claims 2 and 15 satisfy the requirements of Article 33(2) and (3) PCT.

6 Claims 1-30 meet the requirements of Article 33(4) because optimizing weight gain in meat animals is of industrial applicability.